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Biofuels situation update 2010

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Report Highlights:
A 500 million liters per annum ethanol plant is currently under construction in the Chisumbanje region of Zimbabwe under a public/private arrangement. The plant will use sugar as feedstock and is expected to be operational in the first quarter of calendar year 2011. On the other hand, the Zimbabwean government has stopped their support of a *Jatropha curcas* (jatropha) biodiesel project over a lack of funding.

Executive Summary

Zimbabwe's biofuels production program was initiated in 2004 to reduce energy imports through local production of biodiesel and ethanol. The original objective of the government was to have biofuels replacing 10 percent of the country's liquid fuel requirements by 2017.

A large ethanol distillery plant, with the capacity to produce 500 million liters of ethanol, is currently under construction at Chisumbanje in the south-east sugarcane growing area of Zimbabwe. The plant is expected to begin production in the first quarter of calendar year 2011. The ethanol project is a public/private sector partnership called "build-operate-transfer". Despite progress on ethanol, the Zimbabwean government has stopped their support for a biodiesel project that used jatropha as a feedstock. The project was stopped in April 2010 due to a lack of funding.

Policy and Programs

In February 2008, the government of Zimbabwe approved a draft energy policy for the first time since achieving independence in 1980. However, the Zimbabwean government has not yet formulated a comprehensive policy on biofuels. Although a biofuels program was initiated in 2004 to reduce energy imports through local biodiesel and ethanol production, there is no framework that regulates and promotes investment, production, marketing, and use of biofuels. The absence of firm mandates or incentives has slowed any meaningful development of the biofuels sector.

Zimbabwe is dependent on fossil fuels for the generation of energy and all petroleum utilized domestically is imported. Total demand for petroleum is estimated at 1.8 billion liters per annum. Total annual diesel use is estimated at one billion liters, while petrol use is less at an estimated 800 million liters per annum. Zimbabwe's blending target for both ethanol and biodiesel is 10 percent by 2017, and would require 80 million liters of ethanol and 100 million liters biodiesel be produced by 2017.

Ethanol

Zimbabwe's ethanol program is mainly supported by the private sector. In 2008, the Zimbabwean government through the Agricultural and Rural Development Authority (ARDA), a quasi-government organization with large tracts of under-utilized lands, invited investors to develop an ethanol distillery using sugarcane as a feedstock. The agreement with the investors falls under a 20 year 'build, operate and transfer' (BOT) arrangement. Under a BOT arrangement, an investor develops a project for a time sufficient to recover the cost of the investment and make some returns before handing it over to the project owner in working order. In this case, the investors will develop ARDA's land and infrastructure before handing it over at the end of 20 years. The investors are expected to inject a total of US$600

million in the project.

Under this arrangement, a large ethanol distillery plant is currently under construction at Chisumbanje in the southeastern sugar producing area of the country. The plant is expected to be operational in the first quarter of 2011 and will be the largest distillery producing ethanol for biofuel in Zimbabwe with an expected output of 500 million liters per annum. The plant machinery was purchased in Brazil and includes milling, electricity generation, fermentation, distillation and dehydration of ethanol. Government support to the project is through granting it a 'national project status' that entitles all the project equipment to be imported duty-free.

Sugarcane, the feedstock, will be grown at ARDA's Chisumbanje and Middle Sabi Estates where the climate is perfect for sugar production. Currently, investors plan to establish 40,000 hectares of sugarcane while local farmers in the area are envisaged to produce an additional 10,000 hectares as part of an out-grower scheme supplying sugarcane to the plant. Altogether about 50,000 hectares of sugarcane for ethanol production are expected to be established in the next eight years.

Middle Sabi Estates has about 4,000 hectares of irrigated land while Chisumbanje Estates has 2,000 hectares of irrigated land; both of which will be expanded to make up the projected 40,000 hectares for sugarcane production. Project investors are rehabilitating the irrigation facilities at both estates and have been installing new irrigation equipment. The first phase of the program is aiming to plant about 11,000 hectares of sugarcane by the end of the 2010 and 17,000 hectares sugarcane by the end 2012.

Two large sugar mills in the southeast, Triangle Limited and Hippo Valley Estates, produce about 80 percent of the country's sugarcane for sugar processing and are also currently producing ethanol for the export market. Installation of a de-hydration plant at Triangle in 2009 enabled the plant to produce about 1 million liters of fuel-grade ethanol for blending with petrol, adding to the total potential ethanol production capacity in the country. However, the National Oil Company of Zimbabwe (NOCZIM), a wholly owned government company responsible for procurement of petroleum products, still has to finalize modalities for full-scale commercial blending.

Biodiesel

The biodiesel program is largely a state-driven initiative focused on feedstock production. A private company has installed a biodiesel refinery plant on the outskirts of Harare with an annual production capacity of 35 million liters in biodiesel, but it is not involved with feedstock production. The national biodiesel program has not gained momentum mainly due to challenges with developing jatropha as a feedstock. *Jatropha curcas* (jatropha), a non-edible seed with a high oil content of 30 – 35 percent oil is the feedstock chosen for biodiesel production in Zimbabwe.

The Government's biodiesel strategy is to promote feedstock production that does not threaten food

security. Jatropha can be grown in semi-arid or marginal lands and does not compete for prime land with food or feed crops. The government currently estimates that 120,000 hectares of jatropha must be planted in order for biodiesel production to absorb 10 percent of the fuel market.

In 2007, NOCZIM was mandated by the government to promote and produce jatropha for the biodiesel program. NOCZIM pursued several strategies to produce adequate jatropha supplies during the period March 2007 to April 2010. The first season's (March 2007- April 2008) focus was on making available adequate jatropha seedlings for planting. Interested farmers with adequate land and irrigation infrastructure were contracted to set up large low-cost jatropha nurseries for supplying seedlings to plantation growers annually. The seedlings were procured at a price of $0.0015 per seedling.

Farmers and institutions with adequate land were invited to establish jatropha plantations under contract. However, in the first and second seasons of the project, most farmers planted jatropha as hedges after failing to raise adequate funds for land preparation and planting.

Adoption of jatropha and establishing plantations of at least a hectare has been slow. Perhaps the most significant success in feedstock generation so far was achieved in the 2009/10 season. NOCZIM's new strategy of providing tillage to potential growers encouraged farmers to dedicate larger areas averaging between 1.0 to 4.0 hectares to jatropha resulting in plantations covering an area of about 3,800 hectares. The current jatropha plantings area is estimated at about 30,000 hectares out of a projected 120,000 hectares. Most plantations are less than four years old and are still immature.

In April 2010, the government stopped supporting the NOCZIM jatropha program because of a lack of funds. The weak national economy following ten years of significant economic decline and a lack of liquidity in the country have forced the government to shed non-essential activities. Poor coordination in the biodiesel sector also influenced the government's decision to cut funding. Three government ministries, the Ministry of Energy and Power Development, the Ministry of Science and Technology and the Ministry of Agriculture were all involved in biofuels development with no clear mandates or coordination among them. Achievement of the 10 percent biodiesel fuel substitution by 2017 is doubtful.

Consumption and trade

Currently commercial production of biodiesel is negligible and to date no exports have occurred. Commercial blending of petrol with ethanol has not begun, but should begin in 2011 when the Chisumbanje ethanol plant starts operating. However, absence of continued government support will likely prevent further expansion in the biofuels sector.